CHAPTER 7
TRANSPORTATION FACILITIES

7-1. General.

Railroad operations are an essential part of the operation of a storage depot; not only do they allow the efficient movement of large, bulky items, they also provide for economical movement of large quantities of goods by a minimum number of operating personnel. It will be necessary to design railroad facilities that will move freight from the main line of the serving railroad to warehouses and open storage locations within the depot. The design chosen will depend upon the size and purpose of the yard and the size and topography of available sites. Advantage should be taken of relatively level and well-drained sites in order to reduce the amount of earthwork.

7-2. Trackage requirements.

a. Access lines. Access lines will extend from the serving railroad to the boundary of the depot. Their construction will be either at the expense of the serving railroad, the Government, or both. If the expense is assumed by the serving railroad, the design will be approved by the Government. Construction of access lines during the early portion of the construction phase of a depot will provide a means of transporting construction materials to the site. If the length of the access track is greater than 8 km (5 miles), a decision should be made as to whether dual tracks or single track with passing siding should be constructed.

b. Receiving tracks. Receiving tracks are used to accept the rail shipment onto the depot and to separate cars for processing in the classification yard. The number of receiving tracks required is determined by the anticipated density of inbound traffic under worst-case conditions and the rate at which cars can be classified. The length of receiving tracks should be long enough to accommodate the maximum length train. These tracks should have direct access to the engine house. They may be connected to, or considered part of, the classification tracks. As a means of testing air brakes, compressed air lines should be installed in receiving tracks.

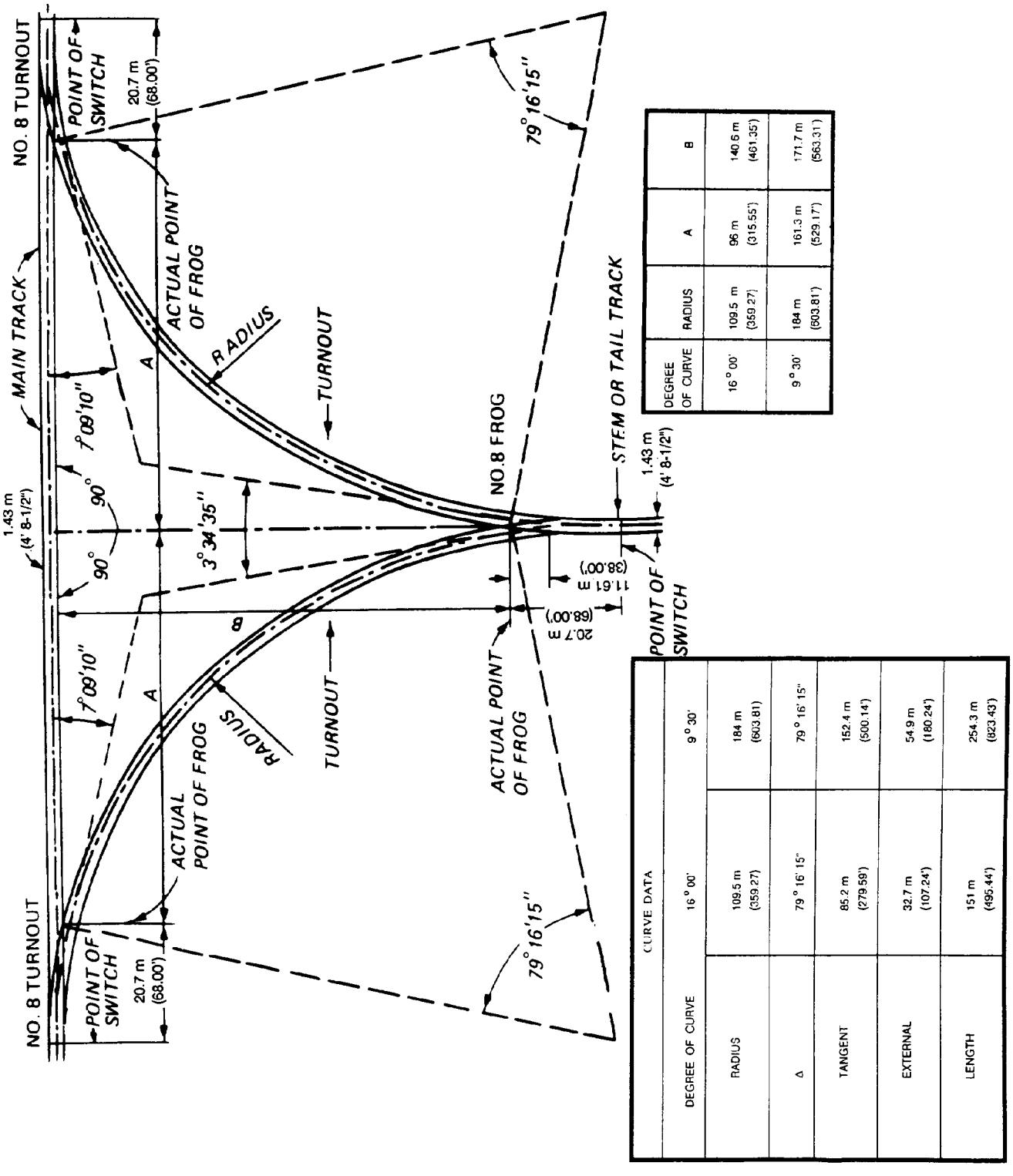
c. Classification tracks. Classification tracks are provided for sorting and forwarding of cars to storage areas and warehouses. They are also used to collect and assemble cars that are prepared for shipment from the depot. The length and number of tracks necessary for a classification yard are dependent upon the number of classifications and the rate of train departures from the yard. Several short classification tracks are more efficient than a few long ones. The classification yard should be double-ended wherever possible. Details of the track layouts necessary to construct a classification yard are found in TM 5-850-2/AFM 88-7, Chap. 2.

d. Departure tracks. Departure tracks are designed on the same principles as receiving tracks, and accommodate trains for inspection, air test, and attaching of locomotive and caboose prior to departure. Civilian practice calls for air lines to test the brakes before arrival of the locomotive. Military trains may be run directly from the classification tracks and the departure tracks omitted, or the receiving tracks can double as departure tracks. The number of tracks is based on rate of classification and train departures. The length is a function of train length and available space.

e. Track to warehouses and storage areas. Tracks to warehouse and storage areas should lead away from the classification yard and serve every warehouse and open storage area where goods carried by rail may go. When planning switches and curves for this type track, TM 5-850-2 should be consulted. The space between parallel warehouses (on the track side) will be sufficient for two house tracks, a third track to facilitate switching operations, and a 4 m (12 ft) wide single road. Track layouts between the warehouses will provide a connection at only one end of the warehouse area except where terrain or operating conditions require a double-end connection. At all single-end lines, bumpers will be constructed to prevent trains from leaving the end of the track. For open end storage areas, there will be at least one track running through the storage area with the required number of platforms to load and unload cars. See chapter 5 for greater platform details.

f. Wyes and tail track. Wyes are track layouts that are used in lieu of turntables for turning of cars and locomotives. They consist of the main track, two turnouts, and a stem or tail track, as shown in figure 7-1. In depot operations the tail track is made long enough to accommodate a locomotive and between 10 and 20 cars.

g. Engine shelter tracks. The engine shelter will be served by the number of tracks necessary to accommodate the number of locomotives utilized at the depot. The shelter will be close to the



DEGREE OF CURVE	RADIUS	A	B
16° 00'	109.5 m (359.27')	96 m (315.55')	140.6 m (461.35')
9° 30'	184 m (603.81')	161.3 m (529.17')	171.7 m (563.31')

CURVE DATA		
DEGREE OF CURVE	16° 00'	9° 30'
RADIUS	109.5 m (359.27)	184 m (603.81)
Δ	79° 16' 15"	79° 16' 15"
TANGENT	85.2 m (279.59')	152.4 m (500.14')
EXTERNAL	32.7 m (107.24')	54.9 m (180.24')
LENGTH	151 m (495.44')	254.3 m (823.43')

Figure 7–1. Typical design of wye trackage.

classification yard, and the tracks serving the shelter will lead from the classification yard.

7-3. Dimensions and clearances.

Dimensions of rail facilities for storage depots within CONUS will be based on the standard American track gage of 1.43 m (4 ft 8½ in). Overhead clearances and platform heights are measured from top of rail, and side clearances are measured from centerline of track. Any item that protrudes within the limits of these clearances is dangerous, and protection must be provided by appropriate warning signs or devices. For example, telltales must be used for overhead clearances ranging between 5.5 and 7 m (18 and 22 ft). The standard clearances are listed in table 7-1; local clearances or special conditions may require greater clearances. On curves, side clearances listed in table 7-1 will be increased 25 mm (1 in) per degree of curvature, with a maximum increase of 450 mm (18 in). When the fixed obstruction is on tangent track but the track is curved within 25 m (80 ft) of the obstruction, the lateral clearances shall be increased according to table 7-2. In a storage depot, train speeds should not be high enough to warrant superelevation of the track; however, if it is deemed necessary to superelevate any trackage, horizontal clearance on the inside rail shall be increased 3½ times the amount of superelevation of the outside rail in addition to the 25 mm (1 in) per degree of curvature.

7-4. Crossing.

Crossing surfaces must be as smooth as possible, and the materials selected for this purpose must be suitable for the type of traffic using the crossing. Although it may be desirable to match the material and texture of approach pavements, consideration must be given to a material and an installation that is economical to maintain and which will have a long service life. Materials such as portland cement concrete or bituminous concrete are economical to install, but are costly to remove and replace. Wood plank and prefabricated materials may be a little more costly to install, but are removable and reusable and therefore are more economical to use in the long run. Furthermore, they are easily removed and replaced, they facilitate the inspection of the track. Materials suitable for crossings are: bituminous concrete, portland cement concrete, precast concrete planks, wood planks, prefabricated rubber planks, modular plastic crossings, used rail, two-component epoxy and rubber. Details of these methods and their advantages can be found in TM 5-627/MO-103/AFM 91-33.

Table 7–1. Minimum safe overhead clearances.

Overhead Wires	
Primary, high voltage, high tension	10 m (35 ft)
Secondary, low voltage, telegraph, telephone, signal and low tension	7.5 m (25 ft)
Guys, messenger, communication, span, and lighting protection wire, and all voltage of effectively grounded continuous metal sheath cables	7.5 m (25 ft)
Miscellaneous Overhead Obstructions	
Building entrances (including engine houses)	5.5 m (18 ft)
Other than building entrances and wires	7 m (22 ft)
Underside of canopies a minimum of 1650 mm (5 ft 6 in) from track centerline	4.7 m (15 ft 6 in)
Side Clearances	
Building (other than for delivery)	2.5 m (8 ft 6 in)
Buildings, without platform (where delivery is required)	2.5 m (8 ft)
Canopies over platform, 4.7 m (15 ft 6 in) or less (delivery to platform required)	2.5 m (8 ft 6 in)
Canopies over platform 4.7 m (15 ft 6 in) or greater	1.7 m (5 ft 6 in)
Platforms between 100 mm (4 in) and 1150 mm (3 ft 9 in)	2 m (6 ft 2 in)
Platforms 100 mm (4 in) or lower	1.5 m (5 ft)
Refrigerator car platforms, between 1 m (3 ft 3 in) and 1.1 m (3 ft 7 in)	2.5 m (8 ft 6 in)
Refrigerator car platform 1 m (3 ft 3 in)	2 m (6 ft 2 in)
Engine house entrances	2 m (6 ft 6 in)
Building entrances (other than engine house)	2.5 m (8 ft)

Table 7–2. Lateral clearances for curved track.

Distance from Obstruction to Curved Track		*Increase per Degree of Curvature*	
m	*(feet)*	*mm*	*(inches)*
0–6	(0–20)	24	(1)
6.1–12	(21–40)	20	(¾)
12.1–18	(41–60)	13	(½)
18.1–25	(61–80)	6	(¼)